

SOME FLEABEETLES INJURIOUS TO BEANS IN TROPICAL AMERICA (GENUS *DIPHAULACA*, FAMILY CHRYSOMELIDAE).

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A few fleabeetles found in cabins of passenger planes arriving at Brownsville, Tex., from the south and submitted for identification represent a species which seriously injures Mexican "frijole" culture but is not yet known in our country. Attacks by this species in the delta of the Rio Grande may be expected. It has long been known under the name *Diphaulaca aulica* (Oliv.) and is externally similar to that species. The two differ, however, in the shape of the aedeagi and must be regarded as distinct. The generic name is to be maintained for them, but most of the species which have been placed in *Diphaulaca* are not congeneric. Nomenclatorial and taxonomic details appear to be as follows:

Diphaulaca Chevrolat 1837 (*in* Dejean, Catalogue de Coléoptères, 3d ed., p. 412) was proposed to include 16 tropical American species, of which 3, *Altica aulica* Oliv. 1808, *Haltica striata* Klug 1829, and *Altica janthinipennis* Latr. 1832, had already received valid names. The first of these, *aulica*, became the genotype through designation by Chevrolat 1845 (*in* d'Orbigny, Dict. Univ. d'Hist. Nat., vol. 5, p. 46). Clark 1865 cited the two prior contributions and gave a formal description for the genus but did not mention *aulica* by name. He credited the generic name to Chevrolat and added descriptions of 9 new species. Six more new species were named by Harold 1875, and several more by Jacoby 1883 and 1902. Few of the species can here be considered, but these require proposal of 2 new generic and 3 new specific names. All material here discussed is in the United States National Museum.

Jacoby's concept of *Diphaulaca aulica* agrees closely with the limits of the genus *Diphaulaca* as here defined. He mentions variability in more than a hundred specimens from Mexico to Guiana, concluding, "I prefer to look upon them as varieties." A different view now seems necessary.

About 50 dissections of male genitalia have been made from among 300 specimens, representing a number of localities from Mexico to Cayenne. These indicate 5 species as below distinguished and probably others not now so clearly indicated. The habitat of this group from Texas to Uruguay should be more adequately sampled and dissections prepared. The internal sac remains unknown, but the cleared aedeagus shows no recognizable armature other than that on the inflexed apex of the orificial plate, which seems to be distinctive in the new species

from Panama. Throughout their habitats these species seem to attack cultivated and wild legumes.

Several specific names have been given to forms similar to, or perhaps conspecific with, *Diphaulaca aulica*. Three of them are mentioned below but are not placed in the following key.

1. Elytra punctate-striate; prothorax red.....2
 Elytra without striae of punctures in series, surface smooth, shining, finely, sparsely, irregularly punctulate; a transverse impressed area at basal fourth delimiting a large, subquadrate, gibbous area near scutellum, separated from humeral callus by a feeble longitudinal impression; form robust, ovate; color black and metallic blue or green; aedeagus subcylindrical, moderately curved, widened and flattened in apical third, rounded at apex, under surface with a very strong, median, lamellate carina in apical half, separating a pair of deep sulci. Mexico to Costa Rica. (*Diphaulaca nitida* Jac. 1883, type of new genus).....*Diphaltica*, new genus.
2. Elytra black with strial punctures becoming irregular, confused, and obsolescent toward apex; base of elytra evenly convex, only the humerus gibbous; form subglobular ovate; aedeagus straight, four times as long as wide, convex and sclerotized above, nearly flat below with side margins subparallel, strongly sclerotized and with median three-fifths membranous from basal third to near apex; eastern part of United States. (*Diphaulaca bicolorata* Horn 1889, type of new genus).....*Hornaltica*, new genus.
 Elytra blue or green, the punctures regular, forming fine striae almost to apex, the humeral and discobasal gibbositities distinct; form more elongate and depressed; aedeagus simple, slightly depressed, curved; Neotropical. (*Diphaulaca* Chev. restricted).....3
3. Antennae, legs, abdomen, and usually the metasternum black or fuscous, elytra dark blue; head and prothorax red; aedeagus rather slender with acute apex; Guatemala.....*Diphaulaca wagneri* Harold 1875.
 Body and appendages red, tarsi and intermediate antennal joints usually somewhat infuscate, elytra bright blue or green.....4
4. Aedeagus relatively broader, its width at basal fourth (sub-basal constriction) almost one-fourth its length, its apex right-angled ogival. Cayenne.....*Diphaulaca aulica* (Oliv. 1808).
 Aedeagus relatively narrower, its strong subbasal constriction about one-seventh as broad as its length.....5
5. Apex of aedeagus ogival, usually acutely angulate, dorsal plate closing the orifice broad, smooth, shining, concave. Cordoba, V. C., Mexico.....*Diphaulaca cordobae*, new species.
 Apex of aedeagus broadly and evenly arcuate or obsoletely angulate.....6
6. Apex of aedeagus subangulately elliptical and slightly elevated, its upper surface broadly concave, with a small, short, median, sub-apical carina or tubercle; the orificial plate nearly plane with two feeble submedian longitudinal costae. Summit, C. Z., Panama.....
Diphaulaca panamae, new species.

Apex of aedeagus broadly rounded and feebly bituberculate at middle of upper margin, the broad shining orificial plate narrowly concave near its apex. Merida, Venezuela.....

Diphaulaca meridae, new species.

Diphaltica nitida (Jac. 1883, Biol. Centr.-Amer., Coleop., vol. 6, pt. 1, p. 265). Of this genotype we have two paratypes received from the Godman-Salvin collection and with these are associated a series from Cordoba, Mexico (Knab, 1907-8), and others from Costa Rica (Schild, Bergdorf, Ballou, Valerio, Nevermann), some of them labeled as on *Cestrum aurantiacum*. Numerous representatives of similar species are not specifically assigned. Jacoby suggests that *nitida* may be a synonym of *Haltica sallei* Harold 1876.

Hornaltica bicolorata (Horn 1889). The excellent description by Horn (Trans. Amer. Ent. Soc., vol. 16, p. 234) and the above-mentioned characters show this little-known species to be unrelated to *Diphaulaca*. *Orestioides* Hatch 1935 (Ent. News, vol. 46, p. 276), genotype *Crepidodera robusta* Lec., is closely related but differs in its arcuate aedeagus, regular elytral punctures, and sharply defined pronotal sulcus. The habits of *bicolorata* are unknown, but its habitat appears to be extensive. One of Horn's cotypes bearing his original label is from Bayou Sara, La.; and another from Detroit, Mich., also in the Hubbard and Schwarz collection, is probably the one from which he recorded that State. Several other specimens are from Fort Monroe, Va., and Coleta and Mobile, Ala.

Diphaulaca wagneri Harold 1875, Coleopt. Heft. 14, p. 5. Type locality, Guatemala. The black legs and abdomen, supposed to distinguish this species, appear in samples from Oaxaca to the Volcano of Chiriqui.

Diphaulaca aulica (Oliv. 1808, Ent. vol. 6, p. 678) is believed to be represented by only one male from its type locality, Cayenne, French Guiana.

Diphaulaca cordobae, new species. Type and 30 paratypes from Cordoba, V. C., Mexico, May 16, 1906, F. Knab; 4 paratypes, Rodriguez Clara, V. C., Mexico, June 20, 1929, on frijoles, A. Dampf; 6 paratypes, St. Lucrecia, V. C., June 21, 1905, F. Knab. Other samples, probably of this species, are labeled Tuxtepec, Oax., Almoloya, Oax., Rincon Antonio, Oax., and Acapulco, in Mexico, but 2 males received from the Godman-Salvin collection, labeled "Atoyac, Vera Cruz, April, H. H. S.," may be mislabeled since they agree with the species below described from Venezuela.

Diphaulaca panamae, new species. Type and 11 paratypes collected on pole beans at Summit, C. Z., Panama, October 30, 1918, H. F. Dietz; 8 paratypes, Toboga Island, Panama, June 12, 1919, Dietz and Zetek; 3 paratypes, Ancon, C. Z., Panama, 1919, Molino and Zetek; 2 paratypes from leaves of red kidney bean, SW. Antioquia, Colombia, F. L. Galego M.

Diphaulaca meridae, new species. Type and 32 paratypes, Merida, Venezuela, S. Briceno; 11 paratypes, Merida, Venezuela (from duplicates of Bowditch collection); 10 paratypes, Trinidad, West Indies, June, 1905, August Busck; 4 paratypes, Aripo savana, Trinidad, October 26, 1918, H. Morrison; 1 paratype, Port of Spain, Trinidad, November 23, 1918, H. Morrison. Some other specimens from the type locality, also from Montserrat, Trinidad, June, 1905, Busck,

and from Caracas, Venezuela, Bro. Anthonius, and A. J. C. Rojas, are not suitable for definite study.

Diphaulaca volkameriae (F. 1792, Ent. Syst., vol. 1, pt. 2, p. 28), long catalogued as from Brazil, was originally described as living on *Volkamera aculeata* (now *Clerodendron*), a West Indian plant on which Wolcott 1936 (Jour. Agr. Univ. Puerto Rico, vol. 20, p. 275) records the similarly blue and red *Oedionychis bicolor* (L.) in Puerto Rico. Pflug, who collected the Fabrician type, was at St. Croix, where he died in 1785, but he had collected on other islands and perhaps on the Caribbean mainland. The Brazilian form recorded under this name as a pest of beans by Monte 1933 (abstract in Rev. Appl. Ent., A, vol. 22, p. 664) may be *striata* Klug. No West Indian sample agreeing with the Fabrician description is known to me.

Diphaulaca striata (Klug 1829, Preis-Verz. Ins.-doubl., Berlin, p. 9) of southern Brazil is represented by only two doubtfully identified females.

Diaphaulaca janthinipennis (Latr. 1832, Voy. Humboldt., vol. 2, p. 24) has no recorded type locality. Its home may have been anywhere on the route which Humboldt traveled from the Guianas to Guayaquil and both coasts of Mexico, but its description does not conform as to sculpture and ventral coloration with species before me unless a few samples from Salvador, which are neither of the two new species listed from Central America, may represent this species.